Malayan Fern Notes, III

Arthropteris in Malaya

by

Betty Molesworth Allen

ARTHROPTERIS J. Smith in J. D. Hooker, Fl. of N. Z. (1854) 53.

A. PALISOTII (Desv.) Alston in Bol. Soc. Brot. vol. 30(1956) 6. syn. *A. obliterata* sensu C. Chr. Ind. Fil. (non R. Br.).

Tapah Hills Forest Reserve, Cameron Highlands Road, Perak, Malaya. On tree in forest near 23rd milestone, at 2,000 feet altitude. Very rare. Coll. numbers: 4594, 7.7.60; 4649, 2.3.61; 5013, 24.4.63.*

This widespread species (and genus) apparently does not appear to have been found previously in the Malay Peninsula nor in Singapore, although Beddome (4) does record it from here, and Ridley (16), under *Nephrolepis ramosa* lists it as having been collected by Matthews in Selangor (Batu Caves), but Holttum (12) states that the genus has not yet been found in Malaya. I have not seen any Malayan material, apart from my own, in other herbaria.

According to Holttum's classification (11), *Arthropteris* belongs to the Dennstaedtiaceae, in the subfamily Oleandroideae, of which both *Oleandra* and *Nephrolepis* are represented in Malaya. Copeland (9), on the other hand puts these into Davalliaceae, as does Miss Tindale in her treatment of this family for SE. Australia (19), (but she uses the subfamily Oleandroideae).

Description of the species in Malaya

The Malayan material matches quite well the description of the species (under either *A. palisotii* or *A. obliterata*) in various works, and herbarium material was examined by me at Kew, British Museum (Nat. Hist.), Singapore Botanic Gardens, and the Smithsonian Institution and I am most grateful to the Directors of these institutions for their courtesy in allowing me to make use of their libraries and collections.

The following description is taken from the Tapah Hills specimens, and from living material unless otherwise stated.

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*The numbers refer to my collection and specimens have been sent to: Royal Botanic Gardens, Kew; British Museum; Singapore Botanic Gardens: Smithsonian Inst.; Chicago Natural History Museum; Natural History Museum, Sweden; and Forest Dept. Sarawak.

Rhizome dark, long-creeping, climbing vertically up tree-trunk for about 8 to 10 metres or more. Rhizome diameter 3–5 mm. (1.5–3 mm. when dry) not more; green when young, maturing dark brown (almost straminous when dry). New growth covered with flat, blackish-brown dull scales which have thick cell walls, a central paler patch and a shiny base; scales are about 1×2 mm. and are drawn out to a blunt apex. Except for the basal part they are fugacious, and so old rhizomes are sparsely scaly. Amongst the scales on newer growth are small, thin brown hairs.

Fronds are spaced 4–5 cm. apart on adult rhizomes, but on new growth may be 5.25 to 6 cm. apart. Fronds are simply pinnate, slightly pendulous and the largest sterile frond seen measured 21.5×4.5 cm.; fertile being between about 20 to 51 cm. long, including stipes, and about 6.75 cm. wide, but most commonly about 38 cm. long. Fronds are usually fertile for about two-thirds of the length, but sometimes all the pinnae are fertile except for the basal auricles which always appear to be sterile. The stipes on adult fronds vary enormously in length from a few centimetres to 17 cm.; rachises are dark, dull and on the underside are densely pubescent. *Pinnae:* jointed to the rachis, from about 21 to 43 uneven pairs with a terminal pinna dissimilar in shape and not jointed. Pinnae, largest in the middle of the frond, becoming gradually reduced to the base, the last five pairs being auricles no more than 1 cm. long, but similar in shape to those above which are commonly 2.2–3.5 cm. long by about 1 cm. wide. Pinnae margins are unevenly crenate and the aroscopic base is truncate and auriculate to a length of 7 mm. and this sometimes overlaps the rachis. The basioscopic base is not auriculate and is sharply cut away from the rachis. Apex of pinna, variable in shape but usually drawn out to a fairly blunt, or less commonly, sharp tip. Lamina medium to yellowish-green and dull with indistinct veins, glabrous (but often covered with epiphyllous growth) on the upper side except for the veins, and below sparsely scattered with very short thin scales, which are lost to a certain extent as the frond matures. On young fronds the scales on the veins are light brown with a slightly pale, thickened and shining edge. When dry, fronds are olive-brown, or with a reddish tinge if dried rapidly. Apical pinna not similar in shape to lateral pinnae, but long-triangular, crenate and often with a lobe at the base, and usually about 3×1 cm. *Veins,* midrib raised above and below, more so above; other veins not raised but sunk below, indistinct, free, to about

12 pairs ending in hydathodes or sori; the lowest acroscopic vein forked several times, the next forked twice with both secondary forks nearly meeting the margin. In fertile fronds the third acroscopic vein often forked twice, otherwise all the others (except the lowest basioscopic vein which is simple) usually forked once only, with one long and one short veinlet. Veins of auricle with several forks. *Sori,* round, placed on vein or veinlets ends occasionally on the forks, usually only one sorus to a vein group and always on the acroscopic veinlet, except on the pinna auricle where there are several sori. *Indusium* reniform, dark brown when mature, not always fugacious.

Juvenile fronds on the rhizomes which were at the tree base, were all about 5×1.75 cm., with 4–5 uneven pairs of small pinnae, yet each apex was already the size of the adult (3×1 cm.); margins of pinnae were faintly crenate, the texture thin and the fronds light green and drying olive-green.

General distribution: From China, Hongkong, Formosa to Siam, Ceylon and the Philippine Islands, Borneo, Sumatra, Java, Christmas Id. (Indian Ocean), Australia to the Pacific Is., Tropical West Africa and Uganda.

As the above distribution shows, it is in no way remarkable that this fern should have turned up in Malaya. In 1960 I found several rhizomes which were on one tree trunk, but no more in the surrounding area although I searched for them, in the very tall forest which is on steeply sloping ground. There was not much undergrowth, and the tree, unfortunately not identified, was near a stream. It had scaly bark and at 40 cm. from the ground was 145 cm. in circumferance and was about 20 m. high. Juvenile fronds of *Arthropteris* were quite common at the base of the trunk and none was fertile. The first fertile frond was at 3 m. up the trunk but that was very old. There were no more for at least another two metres, nearly a dozen were counted. In 1963 newly fertile fronds (seen with field-glasses) were 8–10 m. from the ground and none lower, and the young basal fronds had gone, but others were now on the rhizomes on this and another tree trunk both approximately 100 cm. up. Also another patch was seen nearby growing on a small flat rock near and level with, the stream. There were no mature fronds here (5013).

In the field *Arthropteris obliterata* looks rather similar to the common climbing *Trichomanes auriculatum,* which grows fairly near, but it does seem strange that the former should be so rare here. Oddly enough, within this small locality I have found several other very interesting ferns, a new species of *Tectaria,* another *Tectaria* not yet identified but certainly new to Malaya, and

T. melanocaulis, Cyclosorus papilio and several other rare ferns and gingers. This is a narrow ravine and in the past, does seem to have been left quite undisturbed by the aborigines who have destroyed or opened up most of this forest reserve, especially in this immediate area, so that there is little primitive forest left close to the road. Possibly the reason is that there are many stinging trees in this area: young *Antiaris toxicaria, Laportea stimulans,* which is very common, and some large trees of Renghas (*Gluta* spp.).

The Malayan plant agrees well with other specimens of *A. palisotii* I have seen in various herbaria, except that it appears to be more glabrous on the whole, but this character seems to vary a great deal and is probably not of great importance. I have seen *A. palisotii* growing on trees in Christmas Id., where it is very common, and there it looked identical to the Malayan specimens, some being just as glabrous.

Through the kindness of Mr. Morton, Curator of Ferns, I was able to examine the type material of *A. glabra* at the Smithsonian Institution in Washington. It differed in its entirely glabrous laminae which were thicker in texture, and in the rhizome scales. At Kew, however, I saw some material which seemed to be intermediate between the two species.

The colour of the dried specimens varies greatly although Hooker (14) states that the plants turn blackish when dry, but this seems to depend a great deal on the manner of drying and whether the fronds are young or old. Also the indusia is not always fugacious* often remaining on the sori after maturity, and a note on a sheet from Siam, in Eryl Smith's handwritting indicates that she found this was the case also, and Tindale states that it is persistent.

Notes on nomenclature

Previously *Arthroptoris palisotii* was split into two species, this one being confined to Africa, whilst the other, *A. obliterata* (of which many synonyms were used), was spread through Asia to the Pacific (although Hooker includes W. Tropical Africa in its distribution under *Nephrolepis obliterata*).

Alston (1) and Tindale (19) considered that the two species were conspecific, and so the name *A. palisotii* had to stand, for *A. obliterata* as described by Robert Brown, was not a valid name.

In the past there has been a great deal of confusion surrounding the nomenclature of '*A. obliterata* (R. Br.) J. Sm.' and Miss Tindale has added a clarifying note on this.

*see Copeland (10) and van Alderwerelt van Rosenburg (20).

When the species was included under *Nephrolepis*, Carruthers (6) under *N. trichomanoides* points out that the type sheet of R. Brown's *Nephrodium obliteratum* (collected by Banks and Solander in Australia) was in fact, a true *Nephrolepis*, and gives the tentative name of *N. obliterata* which Alston (1) has quoted. Carruthers goes on to say that the description of *N. obliterata* in Hooker's Species Filicium (14) is taken from *N. ramosa* T. Moore (i.e. Palisot-Beauvois' description of *Aspidium ramosum* and thus *not* from R. Brown's description).*

Robert Brown's specimen is a sterile (true) *Nephrolepis* species, but he describes the sori in his original description (5). As Alston suggests, the name should be abandoned. Christensen (7) gave a fresh description of *Arthropteris obliterata* excluding R. Br's name as a synonym which had been used in part by Smith, viz. *A. obliterata* (R. Br.) J. Sm. in (17). This should not be used as a synonym.

Synonyms

Aspidium palisoti Desveaux, Ges. Naturf. Berl. Mag. 5 (1811) 320. (Basinym).

A. ramosum Palisot-Beauvois, Fl. d'Oware 2 (1818) 54, tab. 91.

A. obliteratum Spr. Syst. 4 (1827) 99.

A. sublobatum Schum. Kongel Dansk. Vid. Sekle. Naturid. & Math. Arth. 4, (1829) 235.

A. undulatum Sw. (?) (see Hooker Sp. Fil. (1862).

Arthropteris obliterata sensu C. Chr. Ind. Fil. (1906) 62. (Exclud. syn. R. Br.).

A. ramosa (Palisot-Beauvois) Mett. Reise Osterr. Freg. Nov. Bot. 1 (1870), 213.

Nephrodium subpectinatum Blume, En. Pl. Jav. (1828) 143.

N. trichomanoides J. Smith, Hook. Bot. Journ. 3 (1841) 413, (name only).

N. repens Brack. Fil. U.S. Expl. Exped. 209 (see Hooker, Sp. Fil. 1862).

Nephrolepis trichomanoides J. Smith, nomen Presl, Epim. (1849) 44.

N. ramosa (Pal.-Beauv.) T. Moore, (1858); (see Syn. Fil. (W. J. H.) 1874, 301).

N. lepidoneuron Fee, ? 1850–52.

N. obliterata Hk. (see Sp. Fil. 4 (1826) 154, non (R. Br.).

Note:—*Nephrolepis obliterata* (R. Br.) Carr. refers to R. Br.'s specimen and so is not a synonym of *Arthropteris palisotii*.

*the brackets are mine.

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Plate 2. *Arthropteris palisotii* (Desv.) Alston.
Juvenile frond, older than those in Pl. 1.
Perak: April 1963. (Photo by F. G. H. Allen).

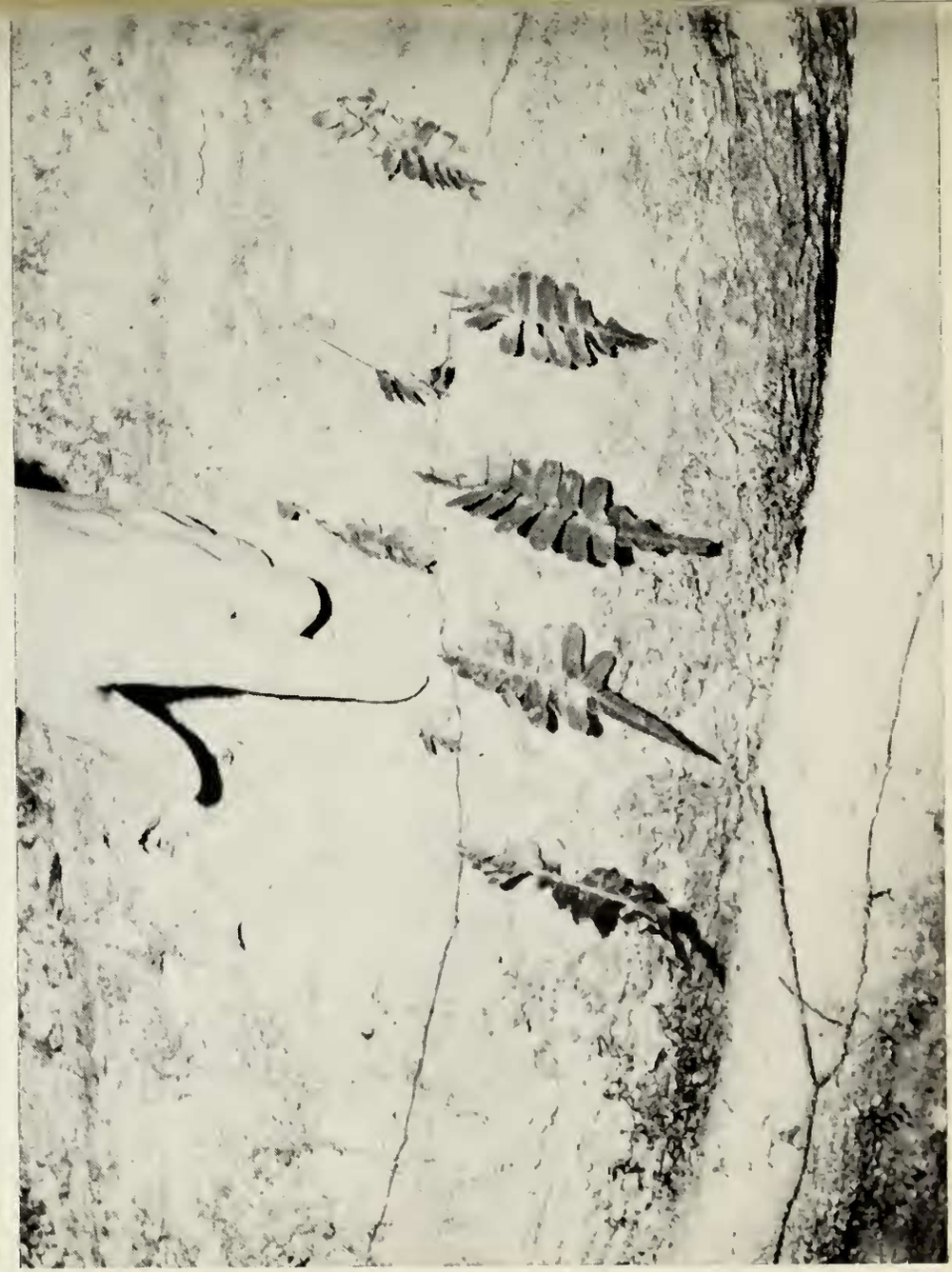

Plate 1. *Arthropteris palisotii* (Desv.) Alston.
Juvenile fronds. Perak: April 1963.
(Photo by F. G. H. Allen).

Plate 3. *Arthropteris palisotii* (Desv.) Alston.
Pinnae showing old sori with persistent indusia.
Perak: July 1960. (Photo by B. E. Allen).